DOCUMENT RESUME

ED 116 995 95 SO 008 824

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TITLE Science: An Indian Perspective. Ten Modules for Learning. Indian Ethnic Heritage Studies Curriculum Development Project, 1974-75.
INSTITUTION South Dakota State Div. of Elementary and Secondary Education, Pierre.
SPONS AGENCY Office of Education (DHEW), Washington, D.C.
PUB DATE 75
NOTE 64p.; For related documents, see SO 008 825-826 and 829; Indian designs may reproduce poorly

EDRS PRICE MF-$0.76 HC-$3.32 Plus Postage
DESCRIPTORS *American Indian Culture; *American Indians; Class Activities; Classification; Elementary Education; Ethnic Studies; Guides; Interdisciplinary Approach; Measurement Techniques; Middle Schools; *Process Education; Science Activities; *Science Units; Skills; Social Studies; *Social Studies Units

ABSTRACT

In this unit, ten modules provide an open approach to science, offering a wide variety of activities and experiences that include aspects of Indian studies incorporated into the regular science curricula. The materials are intended for use in middle grades as part of a social studies program. The objectives of the unit are to develop students' powers of observation, discrimination, and description of organisms in the classroom and outdoors. The following are titles of some of the modules with the skills each entails in parenthesis: Some Scientific Indian Contributions and an Introduction to the Indian's Close Identification with Nature (classifying); Months, Seasons, Indian Signs, and their Meanings (measuring, estimation, observation); Kitchen Chemistry: Making Fried Bread (measurement); Tangrams and Indian Designs (shape); Indian Beginnings, Origins, Cycles (beginnings, origins, cycles); Things in Nature (observation, recording); and Indian Animals and Birds (population, interaction). Each module is an entity in itself and can be selected for teaching individually or in a series. (Author/ND)

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Indian Education
DIVISION OF ELEMENTARY AND SECONDARY EDUCATION
Department of Education and Cultural Affairs
Pierre, South Dakota 57501

Thomas C. Todd
State Superintendent
State of South Dakota

"INDIAN ETHNIC HERITAGE STUDIES CURRICULUM DEVELOPMENT PROJECT"
1974-75

This unit of Indian Cultural Curriculum was initiated, encouraged, and developed under the leadership of Dr. Donald Barnhart, former State Superintendent of Schools of South Dakota.

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This Project was made possible through a grant from Title IX
Ethnic Heritage Studies, ESEA, U.S. Office of Education, Washington, D.C.

Grateful Acknowledgements to the following persons who contributed to the Project from its inception to its completion:

Mike Eckman and Mitch Chapel, Equal Education Opportunity Program, DESE
Dr. Orville Hepler, for Consultant Services
Dr. Roy Krosky and Staff of the General Assistance Center, North Colorado College, Greeley
Dr. Jim Davis and Staff of the Social Science Consortium, University of Colorado, Boulder
Roxy Pestello, Consultant, Social Science Consortium, University of Colorado, Boulder

ABOUT THE AUTHOR

ALAN J. ALLERY was born and raised on the Turtle Mountain Indian Reservation in North Dakota and is an enrolled member of the Turtle Mountain Chippewa.

Alan graduated in 1970 from Mayville State College with a Bachelor of Science in Education and in 1975 from Northern State College in Aberdeen with a Master of Science in Education.

He taught two years at Lansford Public High School in Lansford, North Dakota. Following this he worked two years as the Reservation Coordinator for the American Indian Curriculum Development Program at Belcourt, North Dakota.

Presently, he and his wife, Margaret, and their two sons and one daughter reside in Aberdeen where he is a Counselor and Coordinator of Minority Programs at Northern State College.

Alan developed the following units for this project and these are:

(1) Science - An Indian Perspective

(2) The Indians Speak For Themselves

INTRODUCTION

The 10 modules contained in this unit are an open approach to Science, offering a wide variety of activities and experiences which includes the aspects of Indian Studies incorporated into the regular Science curricula. The students observe and describe objects and organisms in the classroom and outdoors. Through suggested activities such as games and puzzles, children will polish their abilities to describe objects by using color, shape, size, texture, smell and sound.

The objectives of the module are: to develop the children's powers of observation, discrimination and description.

Each module is an entity in itself and can be selected for teaching individually or in a series.

The basic underlying skill of the entire unit is observation and then putting that skill to use.

RATIONALE

One can liken the concept of using Indian Studies in Science to a forest of great and beautiful trees. Some are pine trees, some are oak trees, some are cottonwood trees, some are aspens, and many are other kinds of trees, but all make rich and significant contributions to the variety, the beauty and the dignity of the forest. Thus, an Indian perspective in Science can only serve to enrich and contribute to the variety of the Science curricula.

Please feel free to use and copy any or all parts of this unit, use it and enjoy it!

TABLE OF CONTENTS

SCIENCE AN INDIAN PERSPECTIVE

	TITLE	SKILLS
MODULE 1	COLOR, SHAPE AND CHARACTERISTICS OF INDIAN CRAFTS AND LORE	OBSERVING
MODULE 2	INFERRING BY USING THUNDERBIRDS FROM INDIAN TRIBES AND NATURE	INFERRING OBSERVING
MODULE 3	SOME SCIENTIFIC INDIAN CONTRIBUTIONS AND AN INTRODUCTION TO THE INDIAN'S CLOSE IDENTIFICATION WITH NATURE	CLASSIFYING
MODULE 4	MONTHS, SEASONS, INDIAN SIGNS AND THEIR MEANINGS	MEASURING ESTIMATION OBSERVATION
MODULE 5	KITCHEN CHEMISTRY, MAKING FRIED BREAD	MEASUREMENT
MODULE 6	TANGRAMS AND INDIAN DESIGNS	SHAPE
MODULE 7	INDIAN BEGINNINGS - ORIGINS - CYCLES	BEGINNINGS ORIGINS CYCLES
MODULE 8	THINGS IN NATURE	OBSERVATION RECORDING
MODULE 9	INDIAN ANIMALS AND BIRDS	POPULATION INTERACTION
MODULE 10	POPULATION INTERACTIONS INDIAN APPROACHES	POPULATION INTERACTION

EACH MODULE MAY BE USED IN SEQUENCE OR SEPARATELY

SCIENCE

AN

INDIAN

PERSPECTIVE

COLOR, SHAPE, AND
CHARACTERISTICS OF
INDIAN CRAFTS AND LORE

MODULE 1 - OBSERVING

OBJECTIVES

AT THE END OF THIS MODULE THE CHILD SHOULD BE ABLE TO:

1. IDENTIFY THE COLORS OF THE SPECTRUM.
2. NAME CHARACTERISTICS OF OBJECTS BY USING COLOR, SHAPE AND SIZE.
3. CONSTRUCT DESIGNS ON THE BASIS OF USING GEOMETRIC FIGURES, COLOR, AND SIZE.

RATIONALE

In this module the children learn to combine Visual Observation skills by identifying objects on the basis of color and shape. In addition they will observe relative sizes and identify objects, as large and small. They learn that sense of touch can also be used to observe; they feel objects and describe them. The vocabulary and the skill in making visual and tactile observations will help them describe the objects, places and situations of their environment.

VOCABULARY

Pony Beads

Wampum

Set

Group

Design

Recessive

Spectrum

Seed Beads

Pair

Same

Graphs

Dominant

Prism

INSTRUCTIONAL PROCEDURE

Introduction

Place a pair of beads and wampum in front of the children where they can conveniently observe them. The members of each pair should be identical except for size. It is best to use one pony bead and one seed bead, and Indian made wampum and White made wampum. Color should be the same. Encourage the children to handle the beads and to discuss how they are alike and how they are different.

Materials

As many sets of beads and wampum as there are children. See illustrations below.

ACTIVITY 1

Select a bead and a piece of wampum and ask the children to describe them. How many things can they tell you about the object? Emphasize the use of geometric terms in describing the objects.

Have a resource person from the community come in and show some beadwork and demonstrate the three types of beading, the loom beading, lazy stitch and applique beading.

Ask the children to note the designs on the work and have them jot down as many geometric designs as they see in the work.

NOTE: If a resource person is not available contact someone about using just the beadwork for the purpose of display and picking out geometric designs.

Materials

A resource person with beadwork or assorted beadwork for display.

ACTIVITY 2

Hold up a piece of beadwork. Ask the students to note all the colors. Have them pick out the dominant and recessive colors in the work. List them on a sheet of paper.

Now provide the students with an individual spectrum or a large spectrum on the front board. Have them delve into the colors to determine what the base colors are. Spend some time on each color they have listed to see what colors it takes as a combination to make some of the colors on the list.

Provide a few prisms to give them a functional knowledge of the spectrum via the medium of sunlight.

Ask someone to give a short report on the spectrum from the Encyclopedia Britannica or a Science text.

Materials

Prisms
A Resource Book
Beadwork
Individual sheets of the spectrum or one large sheet of the spectrum.

ACTIVITY 3

Divide the students into small groups to allow them to be closer to a piece of beadwork. Hand out graph paper and have the students graph the design and color exactly as it is on the work they are viewing. They will need colored pencils. (See pages 6, 7, 8, &9.)

Have them take note of the reoccurring designs and the planning that goes into the geometric design. Ask them to be aware again of the color schemes.

After each student has had practice at copying a design, ask them to design a piece of beadwork on graph paper for themselves. Have them use as many geometric designs as possible. Encourage however simple reoccurring designs. They seem to look more attractive. Do not stifle creativity, though. You may use the enclosed designs as models.

Materials

Graph paper
Colored pencils
Beadwork
Designs provided with module
Designs, etc.
See pages 6,7,8, & 9

APPRAISAL

The following are coded messages. Have the children figure out the code and then place the letter above the corresponding number to decode the messages. They are terms and messages from this lesson.

1. w a m p u m
   23 1 13 16 21 13

2. r e c e s s i v e
   18 5 3 5 19 19 9 22 5

3. p a i r
   16 1 9 18

4. d o m i n a n t
   4 15 13 9 14 1 14 20

5. b e a d s
   2 5 1 4 19

6. a p p l i q u e
   1 16 16 12 9 17 24 5

7. p r i s m
   16 18 9 19 13

8. l o o m
   12 15 15 13

9. s p e c t r u m
   19 16 5 3 20 18 21 13

Now ask the students to define those terms they have decoded in their own words or by drawing a picture.

The children should be able to recall most of the terms and their meaning.

Competency Measure

Task 1

Put three different colored beads on the table, ask the children to write down the colors that would be mixed to make the colors of the beads.

Example: yellow and blue = green

The children should be able to do this effectively.

Task 2

Have the students take light apart by use of a prism and list every color they observe.

Task 3

Have the student build one geometric beadwork design on a piece of graph paper.

Materials

Prisms
Colored beads
Graph paper
Colored pencils

SOUTHWEST

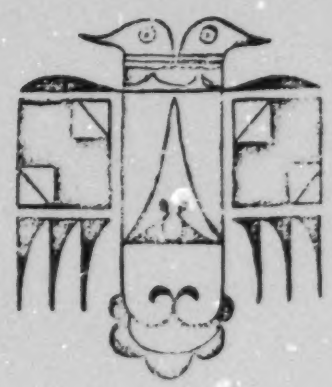
Thunderbird - Sacred
Bearer of Happiness
Unlimited

PUEBLO

SOUTHWEST

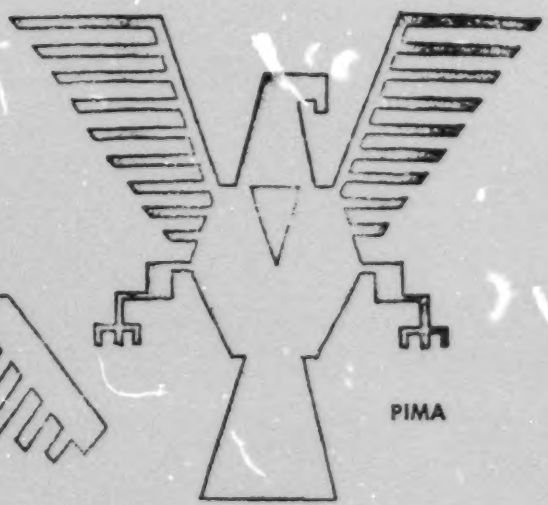
NORTHWEST COAST

ARAPAHO EAGLE

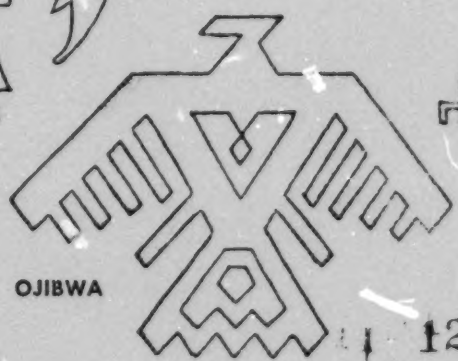


ACOMA

ZIA

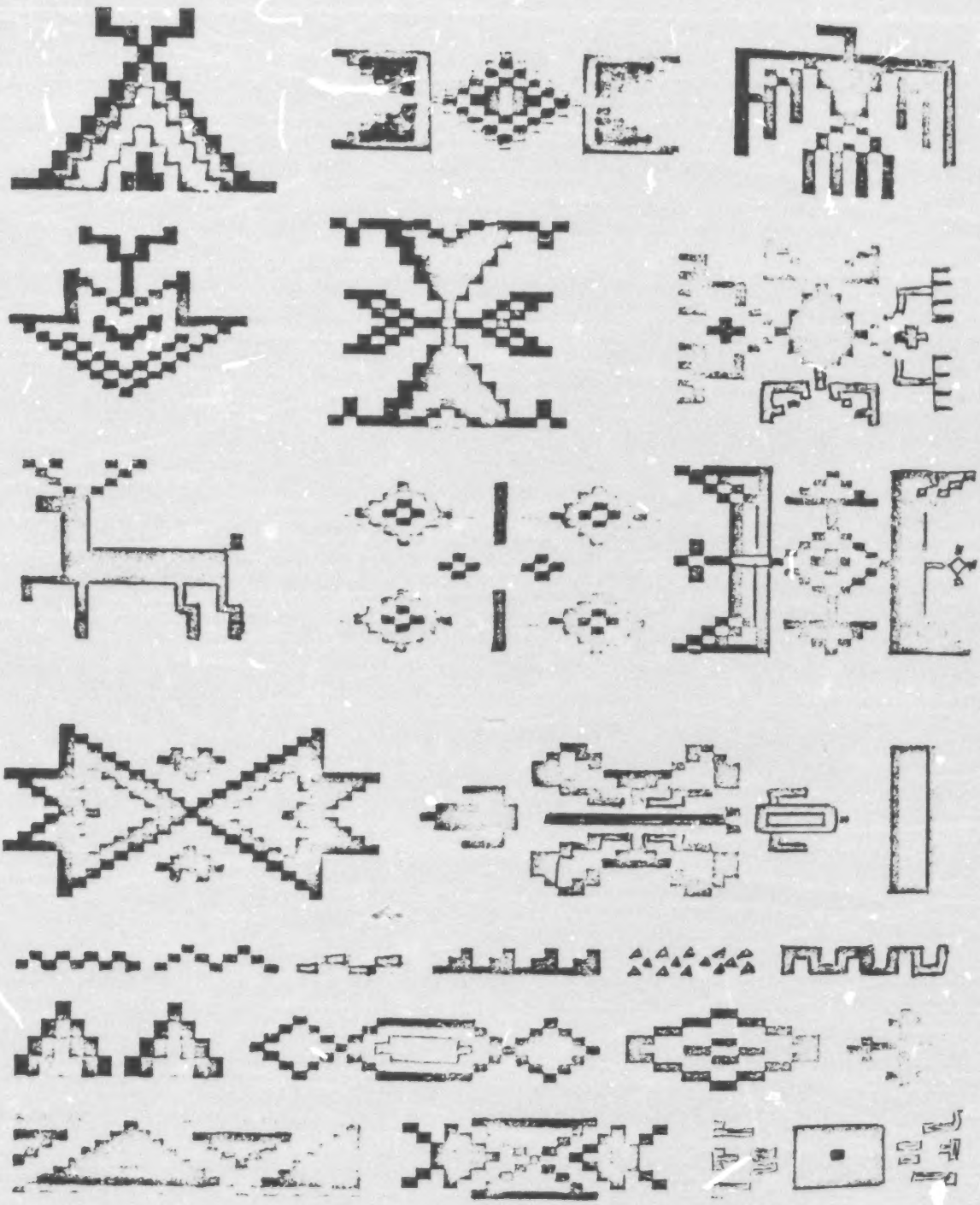


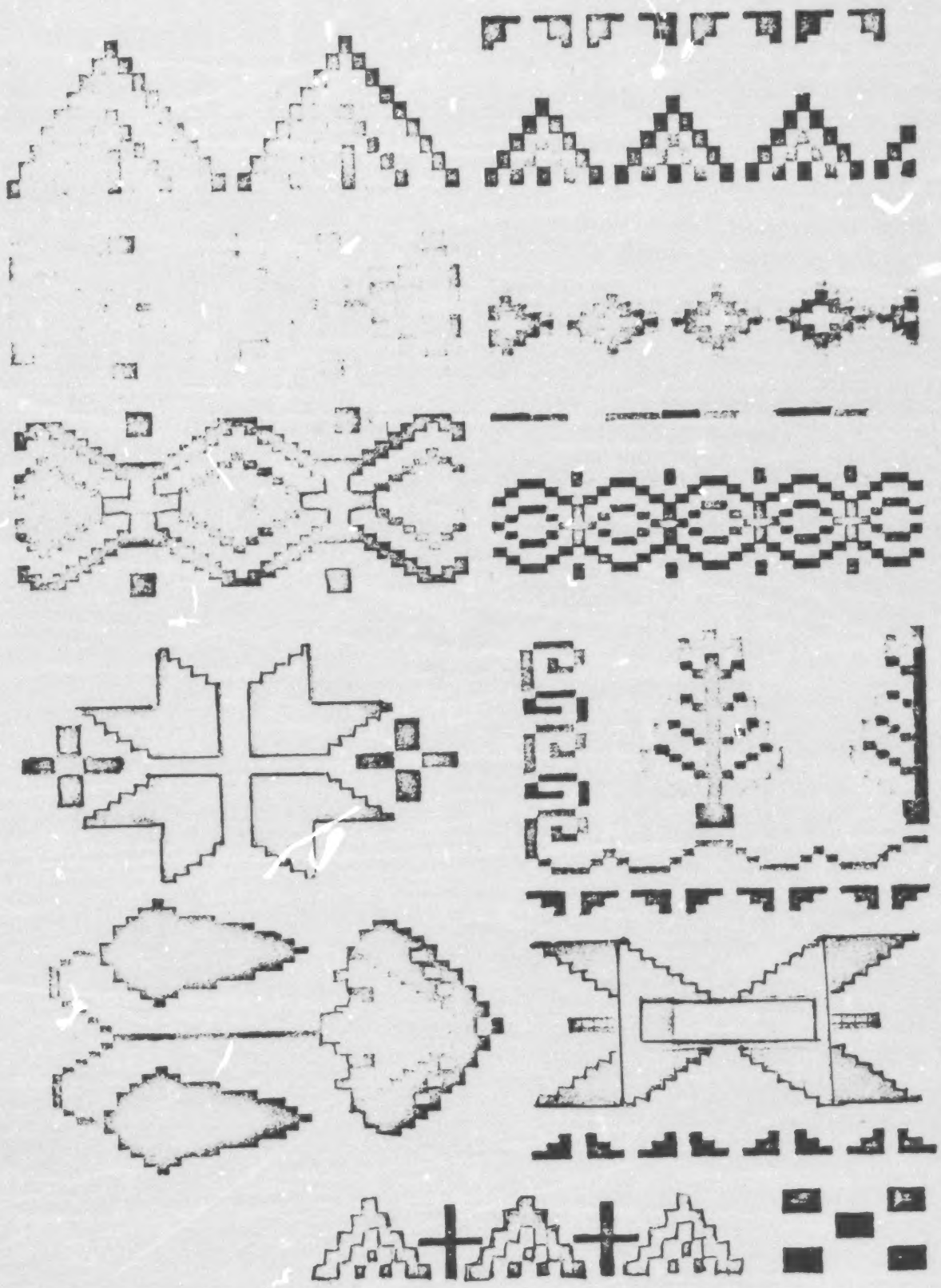
PIMA

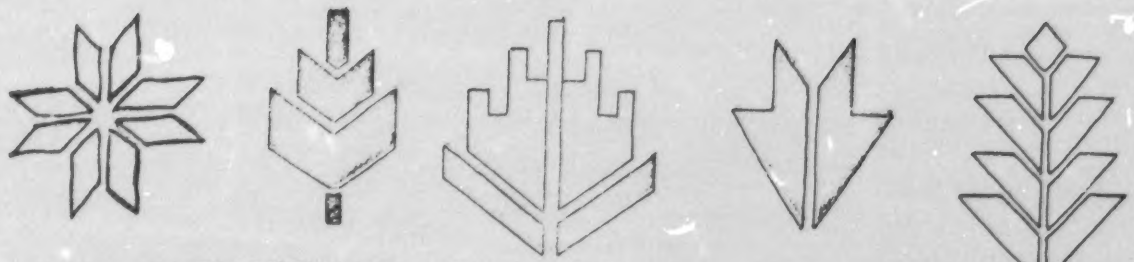


OJIBWA

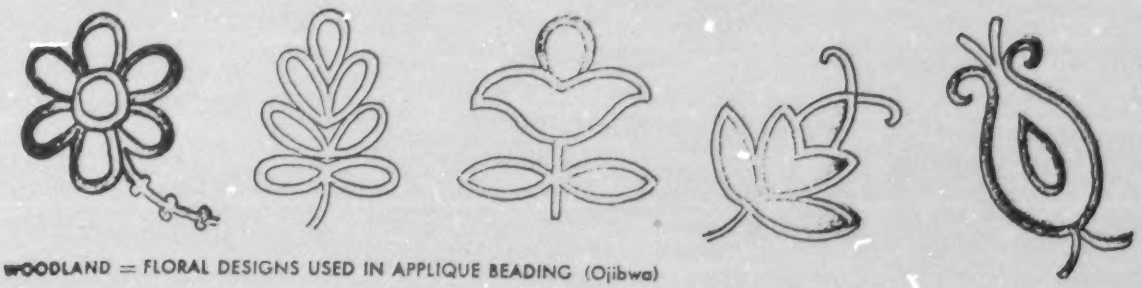
BEADWORK DESIGNS



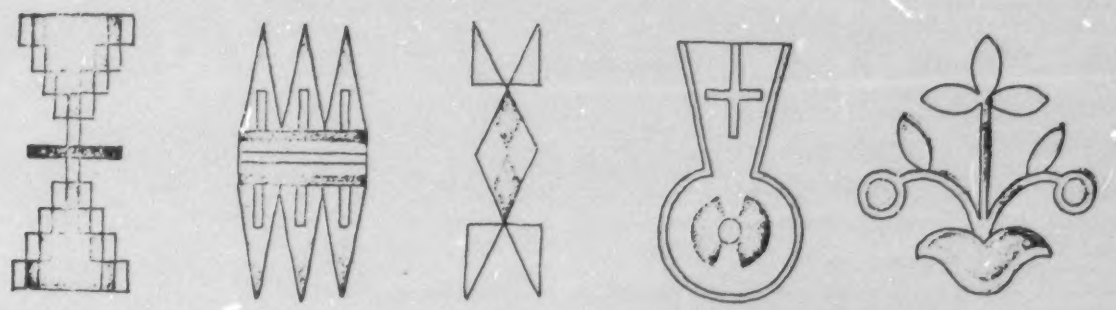




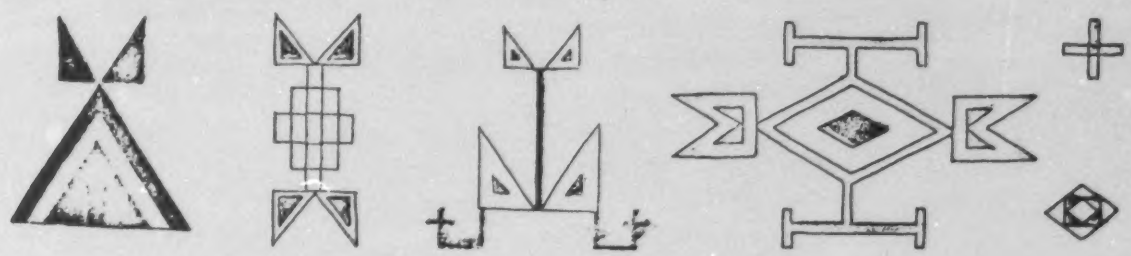
WOODLAND = GEOMETRIC DESIGNS USED IN LOOM BEADING (Ojibwa)



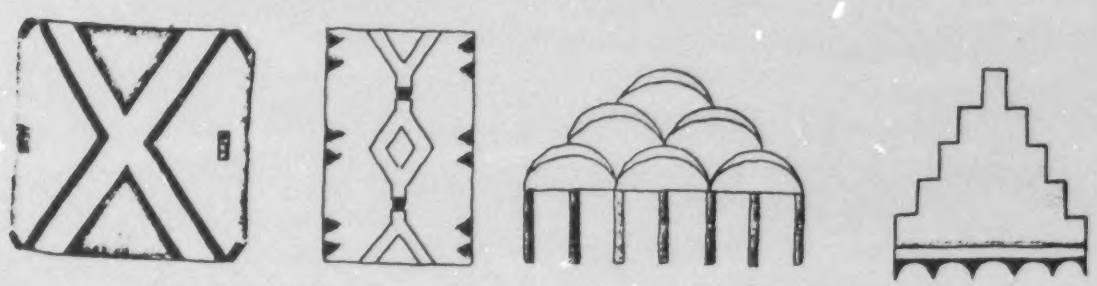
WOODLAND = FLORAL DESIGNS USED IN APPLIQUE BEADING (Ojibwa)



BLACKFOOT = GEOMETRIC AND FLORAL DESIGNS USUALLY APPLIQUED



SIOUX = GEOMETRIC BEADING, USUALLY DONE IN LAZY STITCH

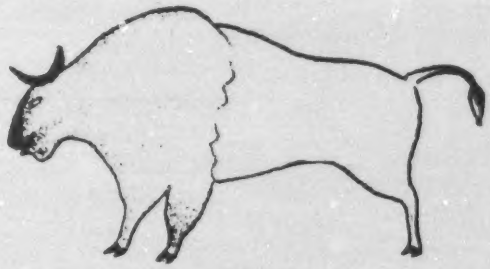


UTE = GEOMETRIC

PUEBLO = PAINTED DESIGNS

OTHER DESIGNS AND SYMBOLS

MANY other designs besides the Thunderbird were used by the Indians to decorate their clothing and pottery. Those shown here are from many sources and will be valuable in decorating your moccasins, vests, war drums, and tepees. Remember that the Indians used colors made from roots, berries, bark and fruits of plants and shrubs, as well as some mineral colors. These were very delicate colors so keep that in mind when you use water colors and enamels.



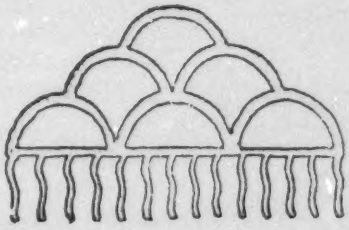
BUFFALO

HORSE

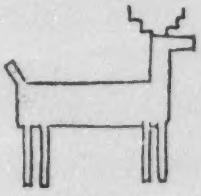
WARRIOR

WOMAN

MAN



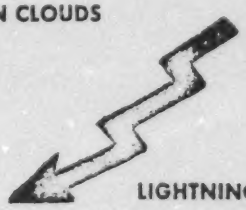
RAIN CLOUDS



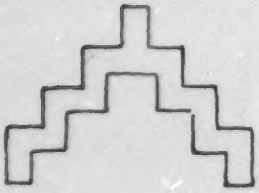
DEER

BUFFALO TRACKS

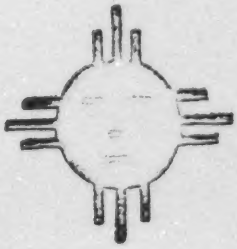
BEAR TRACKS



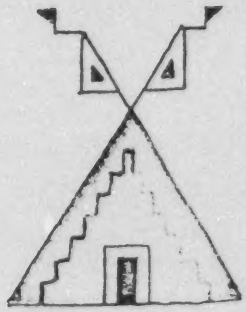
LIGHTNING



MOUNTAINS



SUN



TEPEE

SCIENCE

AN

INDIAN

APPROACH

INFERRING BY USING
THUNDERBIRDS
FROM INDIAN TRIBES AND NATURE

MODULE 2 - INFERENCES AND OBSERVATIONS

OBJECTIVES

AT THE END OF THIS MODULE THE CHILD SHOULD BE ABLE TO:

1. DISTINGUISH BETWEEN OBSERVATIONS AND INFERENCES.
2. CONSTRUCT ONE OR MORE INFERENCES FROM AN OBSERVATION OR SET OF OBSERVATIONS.

RATIONALE

In this module you and your students will be utilizing one of the basic skills of Science, that of comparing and picking out similarities and differences.

Learning to make comparisons in Science takes some skill building to develop some basics from which one can make some inferences. One must be able to tell the difference between an observation and an inference also. This unit should build those skills.

VOCABULARY

Inference

Observation

Phenomena

Comparison

Thunderbird

Mythical

INSTRUCTIONAL PROCEDURE

Introduction

Explain this short story giving background on the Thunderbird.

The mythical Thunderbird, in one form or another, was held in awe by practically all of the Indian Tribes. Here on the Great Plains, where the phenomena of thunderstorms was very striking, the Thunderbird was supposed to be a diety in the form of a bird of enormous size, which produced thunder by flapping its wings and lightning by opening and closing its eyes. These great birds were thought to carry a lake of fresh water on their backs, which caused a great downpour when they flew through the air.

Tribes of the Pacific coast thought the Thunderbird caught whales during a thunderstorm and used its wings as a bow to shoot arrows.

Each Tribe interpreted the bird differently. The Lakota termed the Thunderbird to be the bearer of happiness unlimited.

ACTIVITY 1

Pass out the page of Thunderbird pictures. The pictures are black and white, and would provide a better activity if it is possible to find some colored photos from some library sources.

Have the students list the similarities and differences of the Thunderbirds.

Example:

Sioux

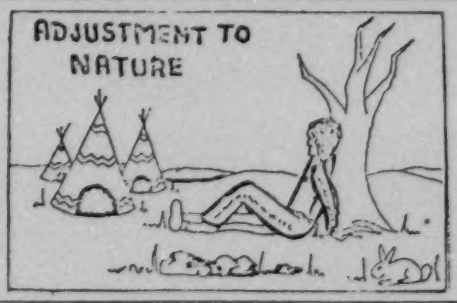
S	D
All have wings	Wings are smaller
Has square features	Has no eye

The skill is to be able to pick out some features in each situation that are common with others and some that are different, thus teaching observation.

Materials: Page of Thunderbird designs
Paper for listing

ACTIVITY 2

Make a bulletin board like the one illustrated below.



Read the following, or provide a handout of the following to the students:

> The background is made from medium blue construction paper, using a light green in the foreground. Construct the tree from brown paper, and make the figure of the Indian resting against it. Outline and highlight the tree in brown. The Indian's clothes are made of yellow and outlined in black. His moccasins are brown. The rabbit is white with a brown outline. A green felt pen was used to draw in the blades of grass, and the rocks are made from gray construction paper with black to outline and highlight. The tipis are made from tan paper using red and blue for the designs. Use a black felt pen for the lettering.

Indian people felt that all things were related people and nature and they wanted to stay in harmony with the universe.

Indians felt that the earth was the mother of all things and that many things about how one should live can be answered by observing nature and making comparisons for inferences.

Copy the enclosed page and pass out for observation. Ask the students to list the things they observe on the page. The children will point out trees, grass, and a log, all of which are easily observable. Ask if there is any evidence that animals have or still do live there.

The children may point out the tiny holes in the trees, the mound of dirt, or the large hole. Point out here to the children that they are inferring the presence of animals on the basis of observation.

Give each child a peanut, walnut, and a hazelnut. Ask them not to open them. The peanut and the hazelnut are products of Indian agriculture.

Have the students observe the characteristics of the nuts, such as texture, shape, symmetry, hardness and color. Refer back to the woodland scene, observe any nut shells.

Ask how the nuts on the ground could have been broken. Then ask the children how they would crack their nuts. They are sure to suggest jumping on it, biting it, squeezing it, or using a nut cracker. Ask if animals would use any of the methods they suggested. Ask how animals use their paws. Finally, ask the students to make an inference about animals being able to crack nuts by biting. The children should suggest characteristics such as strong jaws, sharp teeth, and paws that can hold a nut.

Now take a nutcracker and crack nuts for the children. Point out the teeth on the inner side of the cracker. Let the children list the names of animals with characteristics that would enable them to crack nuts. Squirrels, chipmunks, and gerbils are such animals.

Materials

Nuts for each child
Woodland scene
Nutcracker

APPRAISAL

Give each child a copy of the page with the Indian fishing. Tell the children to look at the picture and carefully make some inferences.

Children probably will make inferences: "the Indian has been fishing a while;" "the Indian has caught some fish;" the Indian has three fish." Accept any reasonable and substantiated inference.

Now tell the children the following story about the picture:

> The Indian used a line with two fishhooks. He has been fishing for a short while and caught two fish at one time the first time he felt a tug on his line. This time one fish took both hooks.

Now, ask the children how they might change or add to the drawing. They will probably tell you they could draw the Indian pulling both fish out on one line, or the Indian placing two hooks on the end of the line.

MATERIALS

Picture of Indian fishing

COMPETENCY MEASURE

Give the children a copy of the footprint enclosed with this unit. Tell them this story:

> Three Indian children saw this footprint while walking through the forest. Each child had something different to say about what he saw. Lone Wolf said, "An animal with sharp claws made that footprint." Long Elk said, "An animal with sharp teeth made that footprint." Fast Horse said, "The footprint is as wide as my foot."

Task 1:

Ask who made an observation? Repeat the story. The children should say "Fast Horse."

Task 2:

Ask who made a reasonable inference? The children should say, "Lone Wolf."

Task 3:

Ask what more can you infer about the foot of the animal that made this track? The children should make a reasonable inference such as one of the following:

a. The animal has widely spaced toes.

b. The animal has five toes.

c. The animal has a padded foot or paw.

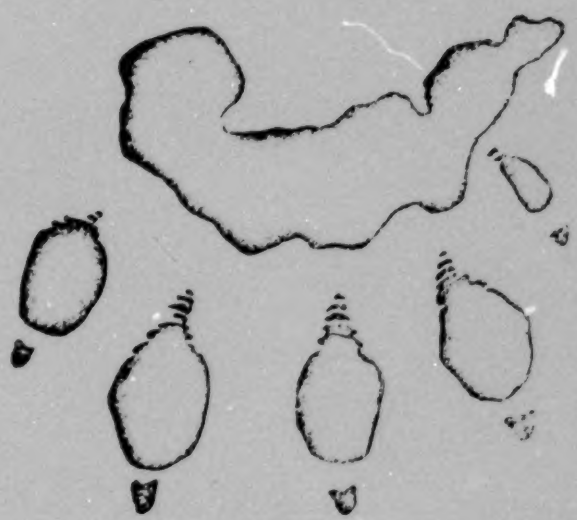
d. The animal has toenails.

e. The animal has curved toes.

f. The animal has long claws.

MATERIAL

Footprint



SCIENCE

AN

INDIAN

PERSPECTIVE

SOME SCIENTIFIC INDIAN CONTRIBUTIONS AND AN INTRODUCTION TO THE INDIAN'S CLOSE IDENTIFICATION WITH NATURE

MODULE 3 - CLASSIFYING

OBJECTIVES

AT THE END OF THIS MODULE THE CHILD SHOULD BE ABLE TO:

1. CONSTRUCT GROUPINGS OF INDIAN CONTRIBUTIONS AND ELEMENTS OF NATURE.
2. NAME AT LEAST FOUR INDIAN CONTRIBUTIONS.

RATIONALE

Children have a deep interest in Nature and all living things. They love to play with them, talk about them and care for them. Their observations of Nature and all living things are often made too quickly and superficially.

This module is designed to give children an experience in observing some Indian contributions and elements of Nature, with the concept that Indians identified very closely with Nature. After finishing this module the children should be able to suggest characteristics of Indian contributions and elements of Nature with which Indians closely identified. The should be able to use that knowledge in grouping things according to their observations. Remember! The characteristics children suggest may not be ones that adults would suggest.

This module provides for an experience in two very accessible areas, Nature and Indian contributions; both are readily accessible for observation and collection. It is recommended that students study both areas over a short period of time, perhaps two to three days, attempting to stimulate interest in further study on an individual basis.

In the first area, the children will be introduced to a number of Indian contributions; they can be classified as to size, shape, color, etc. As they observe and learn about these Indian contributions, discussion can take place about their growth, reproduction and their needs for air, water and food. Some characteristics will be observed easily, others will take time.

It may be helpful for the instructor in this case to refrain from giving any answers and rather try to pull the answers from the students by channeling or managing the classroom and allowing for maximum creativity.

The second area is ideal for two field trips during which a comparison can be made; one field trip can be taken to an area where man has lived in harmony with Nature. The other trip should be taken to an area where man has not lived in harmony with Nature. During both trips students should make collections of things they observe. When they return then they can classify the objects they have observed as to living and non-living. It is anticipated that during the trip to the area where people have lived in harmony with Nature, less non-living materials such as glass, cans, cigarettes, etc., will be found. This then can be used to relate to the value of living in harmony with Nature which traditional Indian people have in the past and still do practice.

An example of an area not in "harmony with Nature" would be a polluted area. An example of an area "in harmony with Nature" would be a non-polluted area.

VOCABULARY

Pumpkin	Squash
Potatoes	Rubber
Tobacco	Tomatoes
Chocolate	Corn
Dyes	Beans
Peanuts	Deer
Chili	Pineapple

ADVANCE PREPARATION

You, as an instructor, might want to prepare a bulletin board recognizing the Indian contributions listed in the vocabulary.

You will then need some items that are closely related to the Indian contributions to slip in during the classifying so there are items for both an Indian contribution grouping and an others grouping.

INSTRUCTIONAL PROCEDURE

Area 1 ---Indian Contributions

Introduction

Show the children a box with three objects in it, a bean, a tomato, and a square rubber eraser. Ask them to handle the box and tell you what is in it by observation through sound. Now open the box and allow the students to observe more closely and relate back to their observations. The students will have probably observed that there was something small, something large, that there were three things, that some things were heavier than others, etc. Allow them all to express their ideas, then point out that all of the items were Indian contributions.

MATERIALS FOR ACTIVITY 1

One or more...

- Pumpkin or pumpkin seeds
- Potato
- Tobacco
- Chocolate squares
- Dye
- Rubber erasers
- Chili pepper
- Squash or squash seeds
- Tomatoes
- Corn
- Beans
- Pear
- Pineapple

ACTIVITY 1

Show the children the items listed above. Point out that all of the items were used by Indians before the colonists arrived and were used to help the colonists live.

Ask the students to classify the items in various ways...

living	-	non-living
edible	-	non-edible
large	-	small
full growth	-	infant stage

and many other ways which you or the students will think of. ALWAYS HAVE AT LEAST two groups for classification.

Ask the children how life might be without these items.

Now, make one more grouping. Add to the list previously provided one or more...

- Oranges
- Apples
- Carrots
- Parsnips
- Hot Dog
- Pencil
- etc.

and ask the students to classify the items in groups of Indian contribution and observe its growth over a period of time.

AREA 2

MATERIALS FOR ACTIVITY 2

Magnifying glass for each student

Introduce the concept of collecting things on a field trip in Nature. Suggest that students collect things such as seeds, rocks, bark, leaves, pine cones, shells, insects, wild flowers, cans, bottles, cigarettes, tinfoil, etc.

Suggest ways of preserving or keeping the items until the students return to the classroom.

Now take a field trip to an area where man has not lived in harmony with nature and return with a collection. When you return classify or group the items by touch, smell, taste, size, color, living, non-living, etc.

Next take the field trip to an area where man has lived in harmony with nature. Classify and group those items.

You, actually at this time without knowing or realizing it, perhaps have constructed a multistage classification system with two main groups, those items from the area of harmony with nature and those items from the non-harmonious area.

Relate this to the concept that Indians lived in harmony with nature and their environment and did not disturb the balance of nature even though this at times meant hard times. They identified with elements of nature closely and had high respect for nature.

Additional activities may entail making a comparative ecological slide presentation or the reading of a story depicting the Indian value of living in balance with nature and reporting either written or orally on it. Stories of this type are now available in most libraries.

APPRAISAL

Ask each child in the room to put five things they collected on the field trips in two sets, one consisting of living things and one of non-living things.

Call the children's attention back to the Indian contributions. Ask them to observe their families' meals for one day. Have them list items used in their everyday life which were contributed in the early days by Indians.

The students could make collages of the two groupings for an extra credit activity.

COMPETENCY MEASURE

Task 1:

Say to the child, tell me one way that we can know whether something is living. The child will name at least one characteristic by saying: it grows; it needs food and water; or it needs air.

Task 2:

Arrange a rubber eraser, a bean, and a ruler in front of a child and ask which are Indian contributions.

Task 3:

Say to the child, tell me as many things as you can that the Indians introduced to the colonists when they began settling North America.

Task 4:

Ask the child to tell of some ways the Indian lived in harmony with nature.

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MONTHS, SEASONS, INDIAN SIGNS AND THEIR MEANINGS

MODULE 4 - MEASURING TIME VIA ESTIMATION AND OBSERVATION

OBJECTIVES

AT THE END OF THIS UNIT THE CHILD WILL BE ABLE TO:

1. MAKE AN ESTIMATION AND USE OBSERVATION AND LOGIC AS A BASE FOR THAT ESTIMATION.
2. MEASURE TIME SEQUENCES BY USING METHODS OTHER THAN THE TRADITIONAL CALENDAR, THUS SHARPENING THE IMPORTANT SKILL OF OBSERVATION.

RATIONALE

This module is an experience in the measuring of time via the medium of Nature. Some of the meanings attached to signs in nature may be regarded as superstition, in much the same way the "Llack cat" is an omen in modern times. Many others, however, are based on logic derived from observing nature and the effect of the changing seasons. Thus, in this module children will learn to make estimations by comparing the seasons and the calendar.

Estimating is a skill that requires familiarity with a measuring system, in this case our present calendar. Practice in extimating leads to a greater facility for the use of a measuring system.

VOCABULARY

Freeze	Moisture
Indicator	Crystals
Halo effect	Migratory
Logic	

INSTRUCTIONAL PROCEDURE

To begin the module about estimation we must take the calendar which we are using on a comparison basis and understand what it consists of and what system used by the Sioux is similar. Perhaps a fun way of setting up that comparison is by using a word jumble puzzle. Here all of the months are mixed up and out of ordinary sequence. The student is required to un-jumble the word or words and place them in an ordinal sequence. The following is the list needed for this exercise, you may scramble them any way you wish, but an example is furnished.

Correct List

January	Snow Moon
February	Hunger Moon
March	Crow Moon
April	Grass Moon
May	Planting Moon
June	Rose Moon
July	Heat Moon
August	Thunder Moon
September	Hunting Moon
October	Falling Leaf Moon
November	Beaver Moon
December	Long Night Moon

Scrambled Example

Cemerbde	Long Night Moon
January	Woononsm (two words)
Vbermeon	Beaver Moon
February	Goonermunh (two words)
Toreboc	Falling Leaf Moon
March	Roonowcm (two words)
Smeeeptbr	Hunting Moon
April	SsooarGm (two words)
Tuusag	Thunder Moon
May	Noginamplmto (two words)
Yulj	Heat Moon
June	Ooosermn

Now ask the students if they feel that any logic was used on the part of the Lakotas in structuring their calendar, was there any estimation?

Invariably things about the snow and January comparison will be brought out to show logic and students will also note that the calendar in both systems is actually an estimation of time.

ACTIVITY 1

Break the students into groups of four. Ask the students in each group to pick a season. (Spring, summer, autumn, winter) Direct the students to write a report that contains information about the seasons and its relationships such as temperature, moisture, length, earth, position, and perhaps a variety of popular activities for that season. The groups will then combine the reports and come up with a consensus estimation of time for each season:

1. According to the equinox method.
2. According to the actual seasons as they occur in their part of the state.

Prior to concluding this activity put the following on the board:

Maturity

Birth

Old Age - Natural Death

Hard things in life

Ask the students to attach one of these meanings to a season. The correct answers are:

Summer - Maturity

Autumn - Old Age - Natural Death

Winter - Hard things in life

Spring - Birth

Ask the students why they think the Lakota attached the above meanings to those seasons. Bring out the point that the seasons are a cycle. That cycle is recurring and is therefore a circle. The circle, according to Lakota religious teachings, is the symbol of the universe.

ACTIVITY 2

Estimation involves the skill of observation. Observation was regarded as a highly valued skill among Indian people because it was crucial for survival.

Introduce the following signs and their meanings by putting them on an overhead projector and having the students take notes and react to the signs and their value in estimating conditions and changes in the environment.

After awhile the students will really get into it, don't worry if they start slowly.

INDIAN SIGNS AND THEIR MEANINGS

1. If muskrats build their houses toward the edge of the lake. → Mild winter

   Logic: A muskrat needs open water to get out of his house. Thus, if he builds near the edge of the lake there won't be a long, hard freeze.

2. If muskrats build their homes in the middle of the lake. → Long winter

   Logic: A muskrat will build in deep water so it will not freeze so he cannot get out of his house if there is going to be a long, hard freeze.

3. If snakes stay around in late fall. → Long fall

   Logic: Snakes hibernate in the winter, thus can be used as an indicator of the length of fall.

4. If rabbits keep their gray colors unusually long. → Long fall

   Logic: Since they turn white in winter we can use them as an indicator of when winter is coming.

5. If rabbits turn white early → Early winter

   Logic: Same as number four.

6. When summer birds linger longer than usual. → Long fall

7. If the little birds arrive early in February and March. → Early spring

8. If crows are seen in February → Early spring

   Logic for 6, 7, and 8: Birds follow instinctive migratory patterns and routes at various times of the year. Their arrival and departure are indicators of the seasons to those who observe them.

9. When leaves on the ash trees turn upwards. → Rain

   Logic: Moisture affects the position of some types of leaves.

10. When cranes return southward in early fall. → Storm

    Logic: They move ahead of a storm.

11. A chattering squirrel. ⟶ A call for rain

Logic: This is more a sign that it will rain than a call for rain. Squirrels will chatter while gathering or eating food; they eat and store food before a rainstorm.

12. If the quarter moon starts downward. ⟶ Rain

Logic: Moon affects the weather on the earth and thus when tipped up signifies the dumping of rain.

13. If quarter moon tips upward. ⟶ Dry weather

Logic: Opposite of number 12.

14. During fall weather if a large rainbow effect ring is noticeable. ⟶ Storm

Logic: Ice crystals cause a halo effect which can be seen before rain or a storm.

15. If a small child holds his hands up to the heat. ⟶ Cold weather

Logic: Cold weather is probably already beginning to set in thus making the child cold. Weather will probably get colder.

All of the aforementioned signs and their interpretations involve the skills of measurement of time, estimation, and observation. Ask the students to bring from home one sign, its meaning, and its logic for tomorrow. Emphasize that listening carefully is a key to getting elders to relate with you. I am sure the morrow will bring many new and interesting signs which students could use along with the ones they already have to improve those critical skills of estimation and observation.

APPRAISAL

Require students to conduct an outdoor estimation/observation experience and report on it. Nature is a treasure chest for this type of appraisal.

COMPETENCY MEASURE

Task 1:

Have children participate in a spell-down activity making use of months and Lakota meanings, seasons and Lakota meanings and signs and their meanings.

Task 2:

Ask each student to make an estimation and write a report. Report must contain observations and logic used in making the estimation.

Materials needed:

Module 4

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KITCHEN CHEMISTRY

MAKING FRIED BREAD

MODULE 5 - MEASUREMENT - HOW MUCH?

OBJECTIVES

AT THE END OF THIS MODULE THE CHILD SHOULD BE ABLE TO:

1. CONSTRUCT THE LIQUID AND DRY MEASURING SYSTEMS FROM SMALLEST TO LARGEST.
2. HAVE A PRACTICAL KNOWLEDGE OF THE APPLICATION OF BOTH SYSTEMS.

RATIONALE

Measurement as far as cooking and volume for common application have been used by people in their everyday lives for ages, way back to B.C.

The children will deal with both liquid and dry measure to familiarize themselves with standard units used in the U.S. today to measure volume for liquid and dry materials. An Indian recipe will be used as a medium for acquiring those measurement skills.

VOCABULARY

Tablespoon	Quart
Teaspoon	Gallon
Cup	Peck
Pint	Bushel
Recipe	Volume
Liquid	Dry

INSTRUCTIONAL PROCEDURE

To begin pass out the following crossword puzzle to help students familiarize themselves with the basic vocabulary for the liquid and dry measure used in this module.

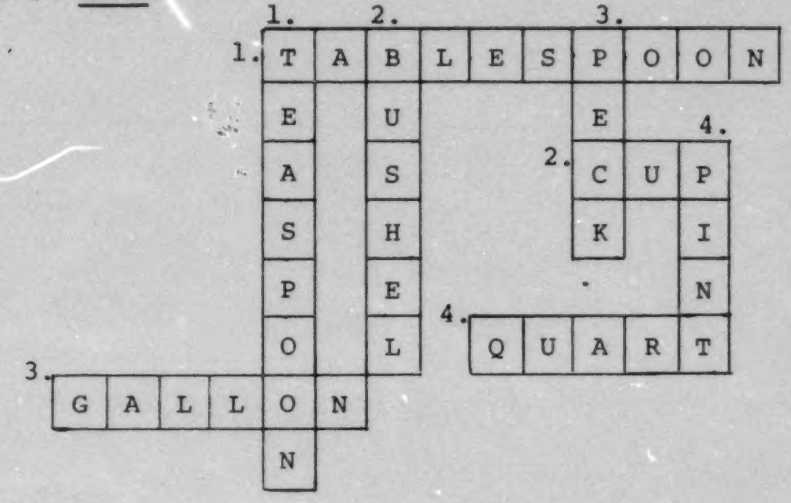
ACTIVITY 1

ACROSS

1. It takes three of #1 down to make this item.
2. Usual measure for a drink.
3. Is equal to sixteen of #2 across.
4. Equals four of #2 across and two of #4 down.

DOWN

1. Eating utensil.
2. Largest dry measure.
3. It rhymes with deck and is used for measuring.
4. Equals two of #2 across.



After the students complete the crossword puzzle have them conduct an inquiry into the liquid and dry systems and construct an individual chart for both systems.

LIQUID

3 teaspoons	=	1 tablespoon
16 tablespoons	=	1 cup
2 cups	=	1 pint
2 pints	=	1 quart
4 quarts	=	1 gallon

DRY

3 teaspoons	=	1 tablespoon
16 tablespoons	=	1 cup
2 cups	=	1 pint
2 pints	=	1 quart
8 quarts	=	1 peck
4 pecks	=	1 bushel

Now that the children have inquired and have constructed a chart, encourage them to mix different multiples to make the same measure.

Example:

2 pints	=	1 quart
4 cups	=	1 quart
64 tablespoons	=	1 quart
192 teaspoons	=	1 quart

Ask each child to go home and measure something for their evening meal and report back tomorrow.

It would be wise to acquire a sample of each measurement for display.

Materials

Teaspoon	Bushel
Tablespoon	Gallon
Cup	Peck
Pint	
Quart	

ACTIVITY 2

Today's task is to use what you know to make accurate measurement. This lesson will deal with the small units of measurement of both the liquid and dry systems.

For many years people have traded recipes for delicious food and somehow, even though they used terms such as pinches, some, a handful, etc., the cooking was good to eat. These days, however, recipes are much more exact and measuring tools are of standard size Make these points early so that you reinforce the way some mothers may still cook, by estimation.

Prior to class heat some fat in a frying pan so it will be ready when you need it.

Using the following recipe have the class divide in groups of about five to a group to mix a batch of Indian fried bread.

1 cup sifted flour
1 teaspoon baking powder
1/4 teaspoon salt
2 tablespoons shortening
3/8 cup milk

Sift dry ingredients, cut in shortening well, add milk to dry mixture. Mix until blended. Roll out on a floured surface and cut in strips of about 3 inches. Slash each in the center. Fry in deep fat until brown, turn and fry on the other side. Drain and eat.

This should make enough for each member of the group to have a piece.

This experience should give each member of the class an opportunity to put measuring units to practical use.

Safety Notes:

The instructor should handle the frying of the bread and should be sure that dull knives are used for cutting and mixing.

Materials

From your school kitchen:

Milk
Salt
Flour
Shortening
Table knives
Electric fry pan
Fat
Absorbent paper
Cups
Teaspoons
Mixing bowls

Special Note:

There may be an Indian resource person in your community to assist you with this experiment.

ACTIVITY 3

The final activity of this unit is obtaining a working knowledge of the large measurement units using the days' milk break as a vehicle for breaking down large units into small units.

For a milk break during the day place the milk in gallon containers, then ask students to break this down into quarts, pints, and then cups for dispersal to each student. Actually, you have integrated the skill of measurement into the student's practical experience and he or she will retain that knowledge much longer.

Do the same with a bushel of apples or oranges, except break it down into bushels, pecks, and quarts.

This activity, which is so very simple, can be one that will leave a lasting learning impression. Be sure to discuss activities as they take place.

Materials

Gallon containers
Quart containers
Cups
Pint containers
Bushel container
Peck containers
Apples
Milk

Note:

Your hot lunch program may be of assistance.

APPRAISAL

Make a table in which the students have to fill in the blank spaces. You will be able to tell if they were able to comprehend the measuring concepts or if they need further work.

Example: Fill in the blanks

Liquid Measurement

1 cup	= _____	teaspoons
1 tablespoon	= _____	teaspoons
1 pint	= _____	cups
1 quart	= _____	pints
1 gallon	= _____	pints
6 cups	= _____	pints
4 gallons	= _____	quarts

Do the same for dry measure.

COMPETENCY MEASURE

Task 1:

Ask each student to list from smallest to largest the units for both the liquid and dry measure.

Task 2:

Ask each student to write a short answer to which measuring system you used to make fried bread and why?

Task 3:

Have each student use a resource book to find out about other measuring systems that might be used. This would be a quest for further information.

They might discover the metric system, the Apothecarie's fluid measure system, Troy weight system, etc.

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TANGRAMS AND
INDIAN DESIGNS

MODULE 6 - SHAPES

OBJECTIVES

AT THE END OF THIS MODULE THE CHILD SHOULD BE ABLE TO:

1. RECOGNIZE AND DESCRIBE THE TRIANGLE, SQUARE AND RHOMBOID.
2. RECOGNIZE AND BUILD SOME INDIAN PICTOGRAPHS AND BASIC DESIGNS.

RATIONALE

Children must learn the shapes that are basic to structures of the world.

In order to learn those shapes a basic hands on approach is necessary to create interest.

This module is designed to give the children an experience with Tangrams during which the basics of Triangles, Squares, and Rhomboids should be mastered.

The student will work with basic designs and then copy some Indian designs after which a creative activity will take place.

VOCABULARY

Square	Rhomboid
Design	Triangle
Tangrams	

ADVANCE PREPARATION

You, as an instructor, must copy enough Tangrams for the class. It is best to use heavy cardboard for durability.

INSTRUCTIONAL PROCEDURE

When introducing the Tangram use the following short legend:

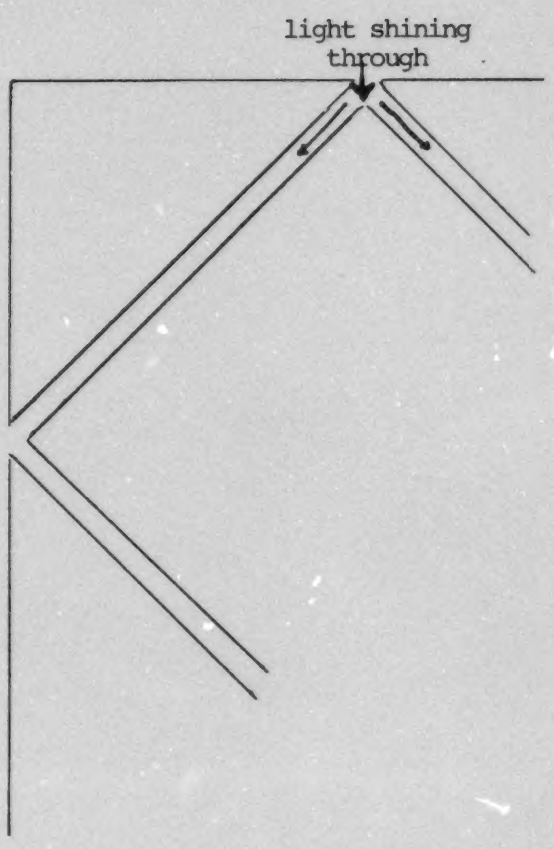
A young Chinese man was building a house and was looking for the perfect tile for his roof. One day he found that perfect square piece of tile and was rushing home when (using the overhead projector toss the pieces of a Tangram on it) he fell and this is what happened.

He then spent the rest of his life putting the pieces in a perfect square again.

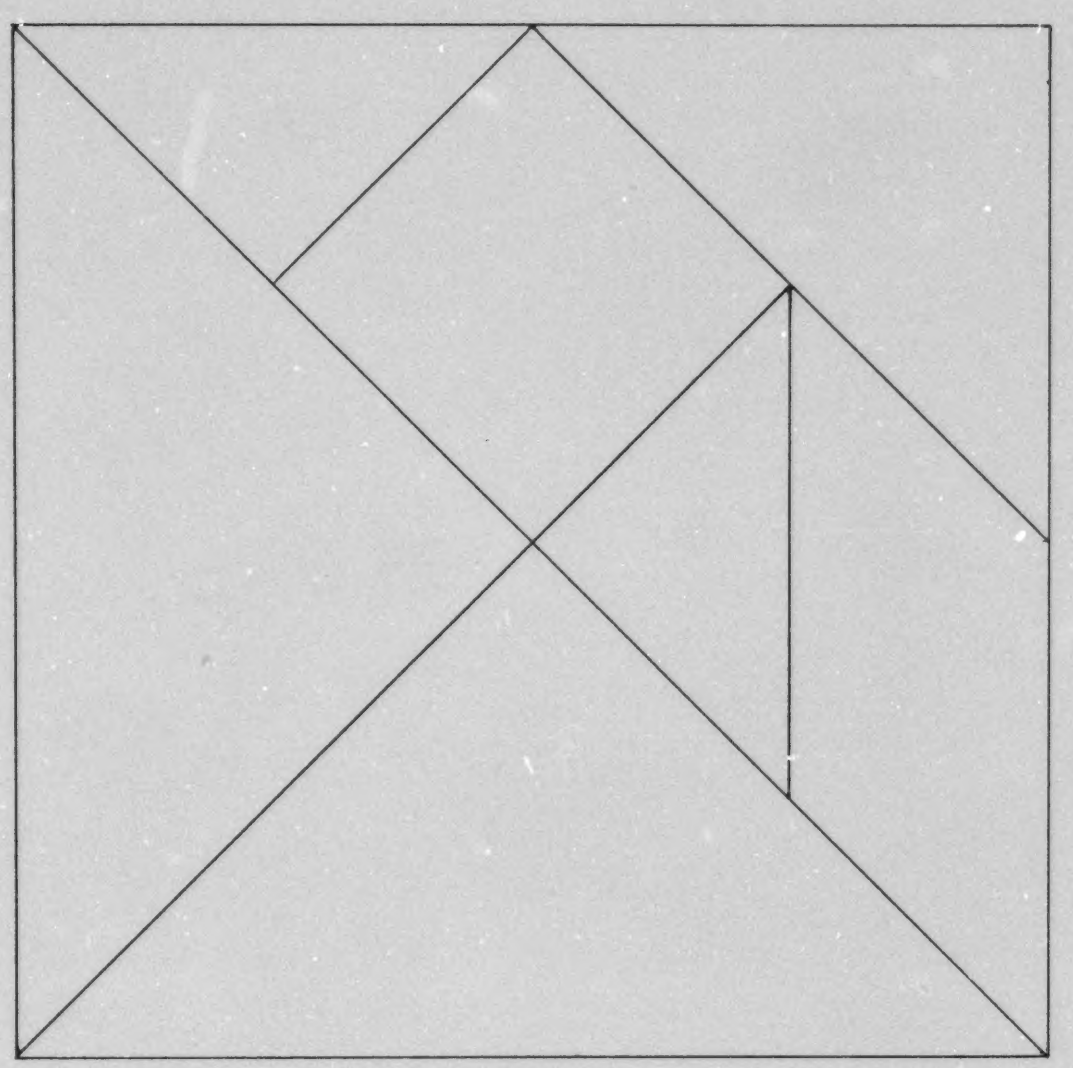
Now hand out envelopes with the pieces of a Tangram in each and ask them to make a perfect square with their pieces.

In the meantime, align your pieces in the shape of a Square, allowing the light to shine through between pieces.

Example:



A Tangram can be made of thin material. It is a Square consisting of five Triangles, a Square and a Rhomboid. It is possible to re-combination these figures into many different figures. The Square is, however, basic. One solution to the Square is below; there are others. The figure below can be used for copying and making additional Tangrams.



This will allow the students to quickly form a Square now, if they were not able to in the time allotted.

Materials

A Tangram for each student

ACTIVITY 1

Take the Tangram, look at the parts and separate the Triangles, the Square, and the Rhomboid.

Talk a little bit about each and ask each student to do some research on those basic figures.

Pass out the Tangrams again, or ask the students to get their Tangrams and try to make three Squares out of the pieces. This should be an easy task. The children should come up with:

Two Triangles, a Square and one Square out of the seven pieces.

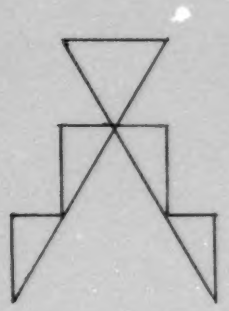
Materials

Tangrams

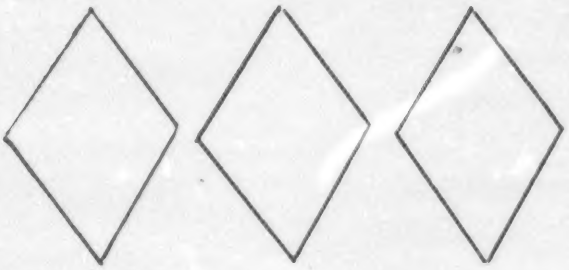
ACTIVITY 2

Let's try some Indian designs now.

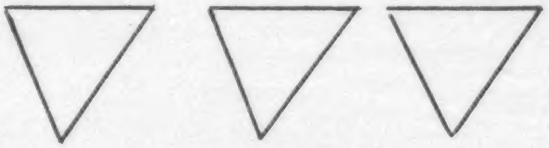
Here is an easy one!



Stands for hill in Indian pictographs.

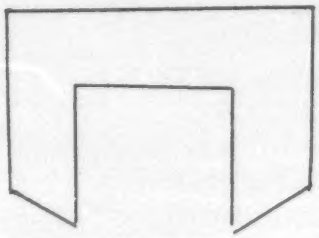


Feathers

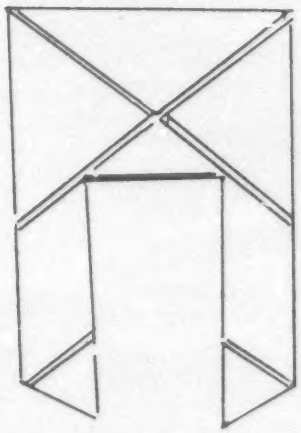


Arrow heads

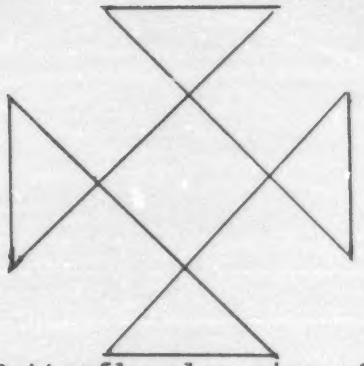
Now ask the students to join together with another person and put their tangrams together to make these designs.



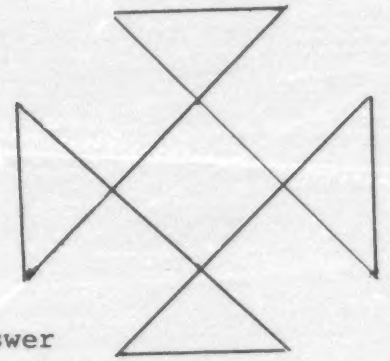
Horse Tracks



Answer

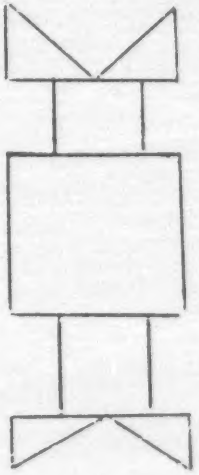


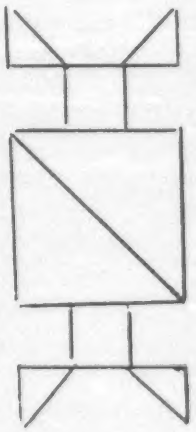
Butterfly also sign of everlasting life.



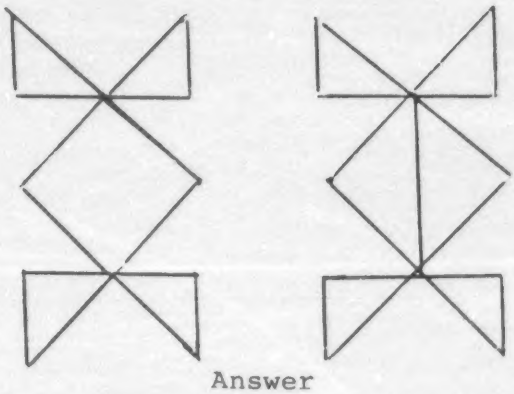
Answer

or patterns like these, which appear in Sioux beadwork





Answer

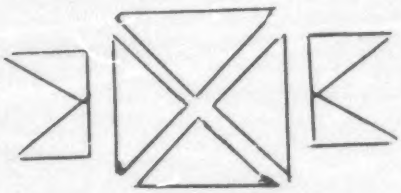


Answer

Note that the Sioux were experts at using the geometric shapes in their communications and craft work.

Other optional designs might be:

1.



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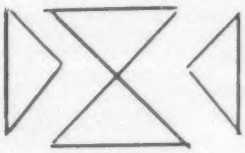

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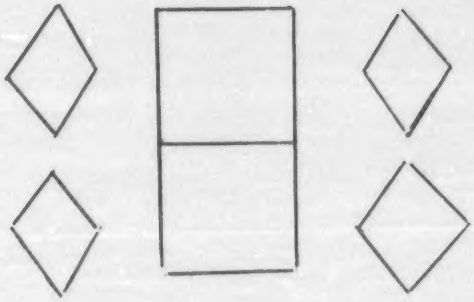

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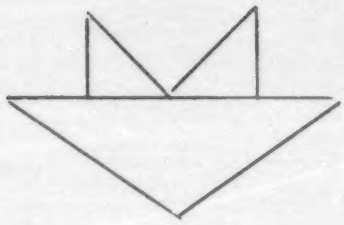

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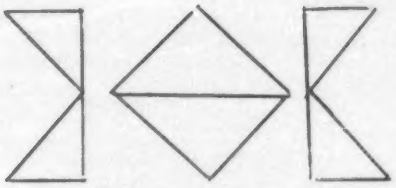


MATERIALS - Tangrams

ACTIVITY 5

Ask the students to return to their own work areas and make a design of their own. It has to be original. This was an Indian tradition to be original, to be the originator of a design. Then ask the students to outline their design on a sheet of paper and share that sheet with a friend. Sharing is an Indian value that is held in high esteem.

MATERIALS - Tangrams

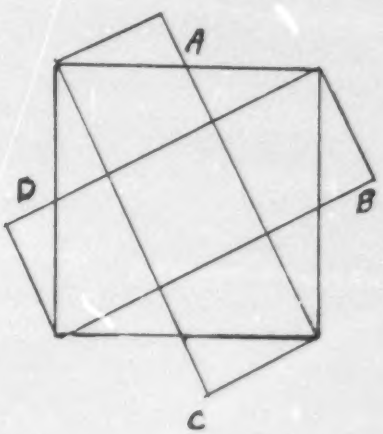
OPTIONAL ACTIVITIES

Five squares from one

Draw a square like the one below on a piece of paper. Then see if you can divide it into five smaller squares, all equal to each other and with a total area equal to the original square.

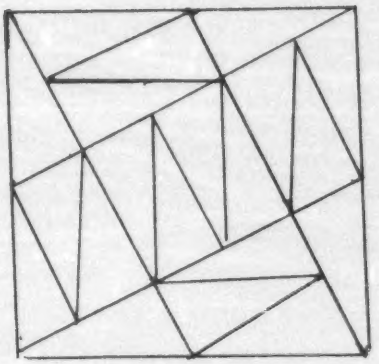
Answer

Bisect the side of the original square at points A, B, C, and D, and draw the lines shown in the diagram.



The five resulting squares will then meet the given conditions.

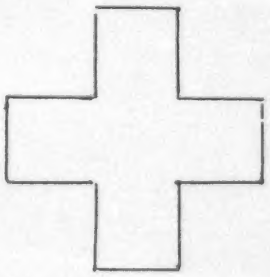
The 20 triangles



This puzzle consists of 20 triangles, each one of the same size and shape. It is no easy matter to fit them together to form a square. Answer is shown.

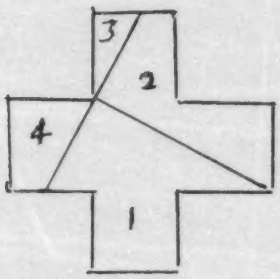
The Cross and Square Puzzle

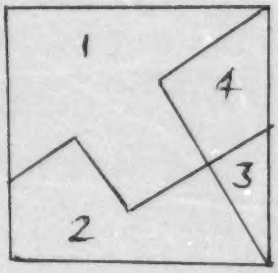
This is a difficult one. Cut from a piece of paper a cross of the type shown in the drawing. It consists of five squares, each the same size. The puzzle is to cut the cross into 4 pieces which,



when fitted together, will form a perfect square.

Answer: The Cross and Square Puzzle.





The method of cutting the cross is shown at the left, and the method of fitting together the 4 pieces at the right.

Rationale:

These simple puzzles will reinforce the learning of the basic shapes learned in this module, the Triangle, Square, and Rhomboid.

Appraisal

Bring back the Tangram again, ask the students to put the pieces in the basic Square again.

Materials

Tangrams

Competency Measure

Use the Tangram again.

Task 1:

Place a Triangle on the overhead. Have the students tell what it is and describe it.

Task 2:

Use the same method with the Square.

Task 3:

Use the same method with the Rhomboid.

SCIENCE

AN

INDIAN

APPROACH

INDIAN BEGINNINGS -
ORIGINS - CYCLES

MODULE Z - BEGINNINGS - ORIGINS - CYCLES

OBJECTIVES

THE STUDENT WILL BE ABLE TO:

1. DEFINE THE TERM BEGINNING AND RECOGNIZE BEGINNINGS OF THINGS IN THEIR ENVIRONMENT.
2. KNOW WHAT A CYCLE IS AND RECOGNIZE CYCLES IN THE WORLD.
3. REALIZE WHAT AN ORIGIN IS AND APPLY IT TO REAL LIFE SITUATIONS.

RATIONALE

This module allows the child to realize the mystery of the beginning of things. Like other modules, this one will also develop the student's power of observation, discrimination, and description.

The study of beginnings is actually the study of cycles. According to Indian tradition, all things travel in cycles or in a circle. During this module we will look at plants and animals and experience a cycle.

Another segment will deal with the origin of Indian People.

VOCABULARY

Beginning	Cycle
Origin	Tradition

INSTRUCTIONAL PROCEDURE

Begin with the concept of origin and build the concept of beginning and cycle on.

ACTIVITY 1

Let's take a look at the concept of origin.

Read the following story to the students:

How The Sioux Nation Was Born

The Sioux people do not claim to be related to any in the whole world. They do not say, as some people do, that their ancestors came from Germany, England, etc. Their oldest legends teach that they are of very unusual ancestry.

Ages ago when the world was young, a great flood visited the western plains. Many tribes came to the "hill of the prairies" to get away from the rising waters. These hills are near the present towns of Pipestone, Minnesota and Flandreau, South Dakota. In the lands of the rising and setting suns, nations were destroyed from the earth. The water continued to rise on the hills until it covered all the people. Their flesh and blood was turned into red pipestone, say the wise old grandfathers.

While the tribes were drownding, a big, bald eagle flew down so that a beautiful maiden could catch hold of its feet. The eagle carried her away to the top of a great tree on a high cliff above the water. Up on this cliff when the water went down again, the girl had twins, and their father was the great war eagle, which had turned into a great chief.

They began a new tribe that was strong and brave. The pipestone, which was the flesh of their ancestors, is smoked as a symbol of peace. The land of the pipestone still belongs to all tribes alike. The eagle's feather is proudly worn on the heads of Sioux braves and the eagle is thought to serve as a link for a direct communication between the Great Spirit and Indian Holy Men, or Medicine Men.

This is a story of origin. Other tribes have similar terms and stories which meant that they were the original people. Sahnish was Arikara meaning "real people". Anishinable is Chippewa or Ojibwa for "original man".

Origin is then, the original starting point, or the first place.

Ask students to bring out some other examples of origin. The earth is perhaps the most common origin point for many things.

ACTIVITY 2

Now that we know what an origin is, let's look at beginnings.

Indian people found that many things began as a result of a series of consequences.

Prepare a planter by cutting off the lower half of two plastic gallon containers. Poke holes in the bottom; about ten holes is enough. Place a drip pan under this container.

Plant a few seeds of corn in each. Point out that it takes soil, water, and air to allow corn to grow.

There are many beginnings of corn every year. The world has come to depend on corn.

It was the American Indian, however, who was the first user or the originator of corn.

This exercise will take some time as the corn will take a few weeks to come up.

Materials

Gallon plastic container
Corn seeds
Drip trays
Soil

ACTIVITY 3

Start a family of mice. Mice are active home builders. Use a plastic box to start a family of mice.

Put small strips of cardboard and paper in the box. Add a few sticks and several stones. Mice love to have things to climb on

They also like to chew sunflower seeds, celery and carrots.

Be sure that your container has holes for air, and water available.

You will also need a male and a female mouse.

Observe the mice over a period of time.

What do they use to build a nest?

Do they ever work together?

When are they most active?

When do they sleep?

How long did it take before they had little ones?

How many did they have?

Is it the origin of the species of mice, or is it a beginning of a new brood?

Materials

Rocks
Paper
A large plastic container
A water bottle
A male and female mouse

ACTIVITY 4

Read aloud this short passage from Black Elk.

The power of the world always works in circles, and everything tries to be round. In the old days when we were a strong and happy people, all our power came to us from the sacred hoop of the nation, and so long as the hoop was unbroken the people flourished. The towering tree was the living center of the hoop, and the circle of the four quarters nourished it. The east gave peace and light, the south gave warmth, the west gave rain, and the north with its cold gave strength and endurance.

This knowledge came to use from the outer world with our religion. Everything the power of the world does is done in a circle.

The sky is round and I have heard that the earth is round like a ball, and so are all the stars. The wind, in its greatest power, whirls. Birds make their nests round, for theirs is the same religion as ours. The sun comes forth and goes down again in a circle. The moon does the same, and both are round.

Even the seasons form a great circle in their changing, and always come back again to where they were. The life of a man is a circle from childhood to childhood and so it is everything where power moves.

Now look at the universe and pick out some things that move in circles. Try to get the students to look into nature, the seasons, the earth, etc., to bring out the cycles and circles they see.

APPRAISAL

Ask the students to start a plant of their own choice.

They should observe and describe what they observed each day for about five to six weeks. Use their descriptions to find out if they understand the concepts in this module.

COMPETENCY MEASURE

Task 1:

Research the origin of Indian Tribes. There are enough tribes in the United States for each student in your classroom to do one.

Task 2:

Diagram a cycle of life. Have the students place themselves in that cycle somewhere.

Task 3:

Ask the students to observe the world around them. Have them keep a list of all the new beginnings they observe for one week .

SCIENCE

AN

INDIAN

PERSPECTIVE

MODULE 8 - OBSERVATION AND RECORDING

OBJECTIVES

1. OBSERVE THROUGH THE USE OF A MICROSCOPE AND RECORD THOSE OBSERVATIONS.
2. USE AND CARE FOR A MICROSCOPE PROPERLY.
3. OBTAIN SOME BASIC FACTS ABOUT THINGS IN NATURE.

RATIONALE

This module deals with the plant life and things in Nature. Modules 9 and 10 will deal with animals and human interaction with Nature.

Nature as a whole must be a fundamental concern of all people.

Within Nature, however, certain things have special importance to certain populations. Among those populations are the American Indians. This module delves into certain relationships Indian people have had with Nature.

VOCABULARY

Respect	Relationships
Interaction	Population
Inquiry	Chemicals
Ceremonies	Characteristics
Nature	Environment

Microscope

INSTRUCTIONAL PROCEDURE

Request the students to bring pictures of pure, undisturbed Nature to school the day before you begin this unit. As a group activity ask them to make a bulletin board somewhere in the school where it can be seen by the entire student body.

ACTIVITY 1

Duplicate the following material for the student to read.

Things In Nature

Water

The rivers, lakes and streams are the most important things of Nature to us. We use the water to drink, to bathe in, and for cooking. Our older people carried water in animal skins when they were hunting or traveling from place to place. Water used to be so pure that there was no need for chemicals of any kind in it.

Trees

There are many trees in this world. However, there are trees which are sacred to the American Indian.

1. Red willow - The inner bark is used for smoking.

2. Grey willow - this willow is used for building sweat lodges.

3. Cottonwood - people doing quill work use the cotton balls as a chewing material to stop the porcupine quills used in quill work from going down their throats. The trunk of the tree was used as firewood. The trunk is also cut in thin slabs and fastened into hoops for drums. They grew straight and tall and made good fence posts. This tree has always been used for Sundance ceremonies.

Thunder and Lightning was an important part of Nature as it was said to bring visions during which the knowledge of medicine or things to come was obtained.

Materials

Duplications

ACTIVITY 2

Now that we have looked at things in Nature from the Indian viewpoint, let's examine the three things we read about from a scientific viewpoint.

Lightning and Thunder

In a storm you see the lightning flash before you hear the thunder that it creates. Both lightning and thunder happen at the same time.

Do you know that you can tell how far away thunder is? When you see the flash of lightning, start counting seconds. Stop when you hear the thunderclap. To find the number of miles you are from the lightning, divide the number of seconds by five.

Example:

20 seconds between lightning and a thunderclap ÷ 5 =
4 miles.

This activity can be explained the day of the module, but will have to be reported on after a rainstorm. The result may be days away. It is a good experience, however.

Do some research. Have the students find out things about thunder and lightning from other books.

Trees

This activity is best done in early fall, but can be used in late spring also.

Send the students out in groups of two. Ask them to gather at least 15 different kinds of leaves. You may wish to have the students mount them, but it is not necessary. They can label them, number them, or identify them in any suitable way.

Ask each group to study the characteristics of the leaves. Have them find something out about the kind of tree it comes from. Try to encourage inquiry.

Water

Take a look at some tap water through a microscope. The child should learn to use a simple microscope, but you as the instructor will have to be sure it is in focus. You might have to practice this skill.

Have the students record what they find.

Next, take a look at some rain or snow water.

Is there a difference? Which is the purest? Do you think the tap water has any chemicals in it? How can you find out?

This exercise has perhaps enlightened the students. They probably have never looked at things in nature in any in depth way. Try to stimulate inquiry.

Materials

Duplications

ACTIVITY 3

Read the following letter from an Indian college student to Nature.

Dear Valley,

I ain't a rich man, Mr. Valley. You know that much, I reckon. Ain't educated right well neither. Ain't really powerful bright, but I know the years have caught up to me. I know what's got to be said. I know I've got to write it out before the end comes. It ain't much, Mr. Valley, so it won't be too awful a waste of your time.

Just want to say a few words to my friends. Never had no home, Mr. Valley. Nobody never cared except all of you. You cared. I want to thank you for it.

Mr. Sun, this is to you. Always liked you fella. Hope that means something to you. You never was too hot nor too bright for me. Always liked your company. Liked the way you'd listen. You was one of the few who wasn't cold.

Mr. Brook, liked you too. Wanted to thank you extra personal for the way you always give me a "Howdy", when I come into the valley. "Howdy" is such a little word. You was one of the few that knew how to say it, cheerful, like there was something behind it.

Mr. Tree, I owe you a lot. Owe you all that shade, all them good, big apples when I was hungry, the loan of that hoarse old Jay that used to sit way up there and chew me out when I was lonely. Never minded. He didn't mean nothing by it. You was good to me, Mr. Tree. Gave me all you had. You was one of the few that never wanted payment.

Mr. Grass, I got a little surprise for you. Something I knew all along, something you was too good to tell me, but I knew it. I knew by the way you was always cool when I came into the valley. You was being good to me, friend. You was always a little softer when I took a notion to lay down. You was always a little greener where I took a notion to walk. You was always good to me. You was one of them that went out of their way.

Mr. Mountain, couldn't forget you. Always liked to watch you standing there at the head of the valley, watching me like something you was a little proud of. Always felt good with you up there, big and quiet, caring a little. Made me feel life was good sometimes. Made me feel safe, and all you had to do was stand there, proud like. Ain't awful hard work, I reckon, but you was one of the few that cared enough to do it.

You, Mr. Valley, you most of all, on account of you never minded if I come to visit. You threw yourself open and what was inside was mine for as long as I stayed. You was generous. The Almighty must've loved you very much to give you all this. Take care of it, Mr. Valley. Stand taller than you've ever stood, Mr. Mountain. You've got a solemn duty here.

I'm afraid to say much more. My leg ain't paining me as bad as she was, but it don't fool me none. I know what's happening. I'd hate to leave this letter unfinished. Wouldn't seem right. After all you've done, it'd be like I was turning my back.

I want to thank you all. Going to miss you, but I'll be in another place that probably looks like this. A place where I won't have to go around to the back door.

Take care of me a little while longer and I won't bother you never again.

Gratefully,

Wilbur L. Ferberry

The students should be able to see the importance of Nature and the things in it from this writing.

Let them try some creative writing about Nature, perhaps a letter

Remember this is not an English Grammar class. Allow the students to express their ideas. Read them all aloud— they're all good.

Materials

Duplications

ACTIVITY 4

This activity will take some research. It will be easy, however, for each student to come up with at least one environmental quote. Here is one just to start it off.

> "Although I die, I shall continue to live in everything that is. The buffalo eats the grass, and I can eat him; when I die, the earth eats me and sprouts more grass. Therefore, nothing is ever lost and each thing is forever."
>
> Old Indian
> About to die.

Ask the students to illustrate their quote. Put those quotes and illustrations up around the room. This activity should stimulate interest in the cycle of things. It seems that everything moves in circles and eventually returns to its starting point. This is the real lesson of Nature. Any interruption causes problems. Are you causing any problems?

APPRAISAL

Find a large colored picture of a Nature scene. Have the students record the things in Nature that they see in the picture. This should stimulate the student's interest in his or her surroundings.

COMPETENCY MEASURE

Task 1:

Recheck the use of the microscope by the student. The student should be able to mount the slide and focus a simple microscope.

Task 2:

Have the student record what he or she sees on the slide they have mounted.

Try to use liquids other than water or onion skin.

Task 3:

Give a matching quiz on the definitions of the vocabulary words.

SCIENCE

AN

INDIAN

PERSPECTIVE

INDIAN ANIMALS
AND BIRDS

MODULE 9 - ANIMAL AND BIRD POPULATION INTERACTION

OBJECTIVES

1. IDENTIFY ANIMALS WHICH ASSISTED THE INDIAN IN LIVING IN HIS WORKADAY WORLD.
2. OBSERVE AND RECORD THOSE OBSERVATIONS.
3. HAVE A WORKING KNOWLEDGE OF SCIENCE DEFINITIONS TO BE USED IN FUTURE YEARS.

RATIONALE

In this module the students will undertake a study of how animals interacted with Indian people. The students will observe and record how animlas were used by Indians. From the interaction of animals among Indian people much can be learned about populations. This module will be a base for module 10.

VOCABULARY

Family
Interaction
Ceremonial
Quills
Recording
Population
Ornaments
Robes
Interdependence

INSTRUCTIONAL PROCEDURE

Make cards for the students with the following information on it.

1 - Buffalo or Bison

Largest wild animal in North America. Indians used the buffalo for making tipis, robes, and other clothing. They ate the meat and used the bones for tools.

2 - Deer

A source of meat and hides for clothing. Espec ally cermonial clothing.

3 - Antelope

Their hide was used in making clothes and robes. Antelope meat was eaten.

4 - Fox

Indians liked to make rugs, caps and bags from the fur of foxes.

5 - Coyotes

A friend of the Sioux Indians. It is said the coyotes used to speak their language.

6 - Beaver

At one time the beaver helped the Lakota Indians by making a bridge for them.

7 - Rabbits

Indians used the soft, warm fur of rabbits to make clothes and robes.

8 - Skunks

Indians made medicine from them.

9 - Muskrats

Muskrats have soft, thick fur which the Indians used to make mittens and caps.

10 - Elk

The Indians ate elk meat. Elk hides were used as robes for shelter. The racks were used for ornaments and tools. The teeth, a sign of prestige, were used as ornaments by the women.

11 - Porcupine

The main use was for delicate sewing called quill work. The quills were picked and dyed. They were then used to decorate vests, jackets, purses, moccasins and belts. The long hairs of the porcupine were used for headdresses or roaches. The meat was eaten and the teeth made into necklaces.

Pass the cards out and let the students themselves introduce this module by reading their card aloud to the class.

ACTIVITY 1

Now that the students have the hang of things as far as animals and their uses by Indians, have them make a card of their own which gives:

1. Animal name.
2. A use of that animal by today's population.

Remember this unit deals with the use of animals as an interaction with other populations. Encourage the use of common animals.

Materials

5 x 8 cards for the class

ACTIVITY 2

By now the students have sharpened their observation skills through the other modules. Use this observation exercise to develop recording skills.

ANIMAL OR BIRD OBSERVATION NOTES

Animal	Animal eats	Where Observed
Sparrow	Seeds	Sidewalk

This observation will be best done in small groups in a park or field area.

Materials

Paper

ACTIVITY 3

Ask students to collect as many pictures of animals and birds as they can. Make a chart from those pictures.

Obtain a large piece of paper or use the blackboard for a chart similar to the one that follows:

NAME	FEEDS ON PLANTS	FEEDS ON OTHER ANIMALS	INDEPENDENT
Example: Birds	Yes	Some (Eagle)	No

Have each student put their animals on the board and decide what interactions the animal has with other populations, plants, etc.

Students are getting the picture now of population independence. Use the pictures for a bulletin board after this exercise.

Materials:

Pictures
Paper (large)
Blackboard

APPRAISAL

The students should obtain definitions of terms used throughout Science programs. Have them define in their own words:

1. Population (what is a)
2. Interaction
3. Inter
4. Family
5. Recording

COMPETENCY MEASURE

Task 1:

Use a matching exercise with the cards from the introduction. Students should be very accurate.

Task 2:

Have the students list a number of organisms that feed on plants, on other animals.

SCIENCE

AN

INDIAN

PERSPECTIVE

POPULATIONS

INTERACTIONS

INDIAN APPROACHES

MODULE 10 - HUMAN POPULATION INTERACTIONS

OBJECTIVES

THE STUDENT WILL BE ABLE TO:

1. IDENTIFY HUMAN INTERACTIONS WITH OTHER ORGANISMS.
2. SUGGEST CONSEQUENCES OF HUMAN INTERACTIONS WITH OTHER ORGANISMS.
3. BECOME PART OF A POPULATION NETWORK.

RATIONALE

Members of the human species interact with each other and with their environments. Indian people tried to interact with their environment on a least harm to other organisms basis. Students will study this module considering some of the consequences of human behavior.

VOCABULARY

Interact	Environment
Organisms	Population
Harmony	Harmful
Nature	Traditional
Adjustment	Plumes

INSTRUCTIONAL PROCEDURE

Begin this module by reading this short story which portrays an interaction between man, Indians in this case, and another population.

Once upon a time a child had wandered away from his village. He was still very young. The child was found by a male and a female bear and their cub. At first, the child was afraid of the bears, but they were kind and took care of the child.

After some time, the child became very used to the bears and treated them as if they were his own father and mother. A little later still, the boy became used to eating the same food as the bears. Their food was mainly meat, berries, honey, and sometimes fish. He knew how to sense danger and also how to be very alert. He did not know, however, that he would one day be taken away from his father and mother bear.

One day a hunting party was passing by. They saw this boy with the bears, and planned how they would capture him and take him back to their village. They watched the boy carefully and when he had drifted away from the bears, one of the hunters took him.

It took five men to tie him up.

After some time, the boy found another way of life. He helped the people of his new home by becoming their guide, and scout. He showed them many things he had learned from his father and mother bear. He showed them many ways to hunt, fish, and find food for the village. The people developed great respect for the bears who had loved and taught the boy.

Thus, to the Indians, bears became special animals, thought to have powers of life and healing. Love had been passed from animals to man and back again.

ACTIVITY 1

Interaction with other Populations

Find four pictures from recent magazines that show man interacting with other populations. Some suggestions are:

An Indian hunting
A cowboy herding cattle
A man fishing
A plane spraying crops
etc.

Take each instance and list how each interaction is helpful to man. Then look at how each interaction could be possibly harmful.

Example:

Helpful

A plane spraying crops. The plane is spraying the field to prevent insect from destroying the crops.

Harmful

The spray may contain harmful chemicals which may be absorbed by the crops.

ACTIVITY 2

Interaction Results

In what ways can interactions help man? In what way can they harm man? How can living in harmony be a key?

Read aloud the following to the class:

Harmony means getting along with something. Harmony means making adjustments. Going to school results in an adjustment: If you didn't, you would be unhappy and you would make others unhappy.

Nature is everyone and everything around us. It may be divided into four parts:

1. Ourselves - without ourselves we wouldn't know that others exist.
2. God - without a maker nothing would exist.
3. Fellow man - it would be a dull world without the people around us for company.
4. The world - this includes everything else, animals, plants, rocks, water, land, sun, moon, stars, etc.

Many people in the past tried to conquer nature. They were never truly at peace with any of the important parts of nature. They are not at peace with themselves, or God, or their fellow man. We can still see this in wars, riots, and violence around us. Today the Indian world is trying to teach non-Indians a lesson from the past by teaching traditional adjustment to nature.

First, let's look at how the Indian viewed God and the world. He considered both to be holy, or sacred. He viewed his animal friends as brothers, the rocks, plants, etc., as holy things given to him by the Great Spirit. If you could have visited with a wise old Indian, before the non-Indian came, you might have heard him say something like the following:

> "I am an old man and I have lived a long time. After looking around me, I have decided this, that the Great Spirit is our father and the earth is our mother, because out of it he made us."

If we accept this viewpoint of the things of the earth as being sacred and belonging to God, we would probably not destroy or pollute them.

The way the old-time-Indian looked at himself was that he was a part of the things around him that we call nature and if nature was sacred then, he, being part of nature, was also sacred, as well as his fellow man. He did not try to cheat or destroy his fellow man.

It is true that the Indians did kill animals for food, and that they used a part of nature to make a living for themselves and their families. However, we must ermember that they used only what they needed to survive, and that no part of an animal was ever wasted.

It is very important for people to learn to get along with each other. Have the students construct an interaction diagram like the one that follows:

HELPS MAN	HARMS MAN		SUGGESTIONS FOR HARMONY AS INDIANS WOULD PROBABLY LIVE
Saves plants which beetles destroy		man ——poisons—— beetles	
Provides food and oil		man ——catches—— whales	
Provides cigarettes, cigars and pipe tobacco		man ——plants—— tobacco	
Provides skin for coats, hats		man ——traps—— beavers	
Provides wool for clothing		man ——raises—— sheep	
Provides Christmas trees, clears land for buildings or roads		man ——cuts down—— pine trees	
Provides meat for food, provides sport		man ——shoots—— ducks	

This should have the effect of bringing out points of importance such as harmony, adjustment, interaction and population.

GOING - GOING - GONE?

Buffalo meat was once used for food. All other parts of the Buffalo were used by the Indian also. The plumes of snowy Egrets, were widely used to decorate women's hats.

Both animals were hunted in such great numbers by non-Indians that almost all members of these populations were killed.

Other animals that represent populations in danger are the bald eagle, polar bear, and sea otter. What kinds of interactions caused these populations to decrease?

Have the student write an original essay with a solution to the problem of interaction with any of the populations discussed. Be sure to present supportive data for all of their conclusions or solutions.

APPRAISAL

Present a photo of a human interaction. Have the students list the consequences of that interaction.

Next have them list some human interactions which could have prevented the consequences. A forest fire might be a prime example.

COMPETENCY MEASURE

Task 1:

Have the students define the vocabulary words through a matching exercise.

Task 2:

Prepare a set of index cards with a plant or animal printed on it. Have the students pick what they wish.

Have the whole class sit close together on the floor. Pin a card on each student so that the other students can read it. Pass out pieces of yarn. Have each student hold one end of a piece and give the other to another student with an organism with which he or she would like to interact. Use as many pieces of yarn as it takes to make an interaction net.

When all possible combinations are hooked up, ask each student to pull in on the yarn until the net is firm. Tell members of the class to hold the lines steady and to stay loose and relaxed with their eyes closed. When all are ready, pick a good spot and press down quickly on one part of the net.

Do they get the point? Try it. It's fun.

ACKNOWLEDGMENTS

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Editing by Margaret Allery